

PHONE NO. : 208 883 0533

Jun. 03 1999 10:15AM P1

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**Dr. Dale R. Ralston, PE PG**  
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June 9, 1999

Two page FAX

Mike Fitzgerald  
 TerraGraphics Environmental Engineering  
 108 W. Idaho  
 Kellogg, ID 83837

Dear Mike:

The purpose of this letter is to provide you with a trip report relative to a meeting dealing with acid water mitigation from the Bunker Hill Mine. The meeting was held in Kellogg on June 8, 1999. We also visited hiked around the West Fork of Milo Creek drainage. The meeting included representatives from EPA, DEQ, CH2M-Hill and the mine owner.

John Riley reported on information gained from the reconnaissance investigations of the Flood-Stanly orebody in the upper portion of the mine. John, Bill Hudson and Nick Zilka have explored both mapped and unmapped portions of the upper country (above the 9 level). Several conclusions may be drawn from their work. First, there are numerous mined areas (both drifts and stopes) that do not appear on the mine maps. Second, conditions in 1999 have been similar to what was found by University of Idaho researchers in the 1980's except for a sampling run in late May. Much higher flow (380 gpm versus 28 gpm) was found at the Stanly Cross-cut on 9 level. This correlates with Bob Hopper's observations concerning increased inflow from portions of the upper country of the mine.

We hiked around the West Fork drainage in the afternoon. Jim Stefanoff observed flow into one of the Phil Sheridan raises during a site visit one week ago. There was no flow into the raise during our visit. However, some flow in the channel was evident about 100 feet up channel from the raise. The flow was about 40 to 60 gpm several hundred feet further up the channel. We could not determine if the stream loss was into the alluvium or the underlying bedrock.

My recommendations relative to the project as a result of the June 8, 1999 meeting are noted below.

Post-it Fax Note 7871		Date	6/9/99	# of pages	2
To		From			
Mary Kay		Mike F.			
Co./Dept.		Co.			
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Fax #		Fax #			

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PHONE NO. : 208 883 0533

Jun. 09 1999 10:15AM P2

FROM :

- being done*
- ✓ 1. The reconnaissance efforts underground by John, Bill and Nick are valuable and should continue. They should be provided with a laser distance measurement instrument to help in quantifying distances underground.
  - ✓ 2. The identification of areas of high recharge potential continues to be a very high priority. Jim Stefanoff indicated that CH2M-Hill was preparing a document on this topic. We need to push this effort as much as possible.
  - ✓ 3. Field exploration of recharge (or recharge potential) is needed. A track-hoe could be used in the field to determine the depth of alluvial sediments in the channel in stream loss areas. A small drill rig could be used within the West Fork drainage to determine vertical ground water gradient and thus identify the edge of the cone of depression created by the mine. This information is needed to site any surface water diversion structures.
  - ✓ 4. Consideration should be given to conducting a tracer test within the West Fork drainage. A tracer could be injected into the West Fork above the losing reaches of the channel. Monitoring would be done on the upper levels of the mine (down to 9 level). Lithium and bromide are possible tracers. This test would need to be done within a week or so to coincide with the melting of the remaining snowpack.

Please contact me if you have questions relative to this letter. Thank you.

Sincerely,

  
 Dale R. Ralston

7-1-99  
 These issues  
 of Dale's will be  
 addressed in next  
 steps memo for discussion  
 mitigations being  
 prepared by Hill.  
 when

*may need to do  
 on surface recon  
 too for flood  
 step mice  
 based on  
 amt of water  
 + chemistry*

*would need to do  
 for S and W Forks  
 to better define  
 placement of diversion,  
 but don't have to do  
 now - would be R-D  
 work.*